

**IN THE UNITED STATES PATENT & TRADEMARK OFFICE**

ATTORNEY DOCKET NUMBER: 200400612-1

IN RE APPLICATION OF: U.S. Patent No. 7,197,433

USPTO CONFIRMATION CODE: 8718

APPLICATION NO.: 10/820,786

FILED: Apr. 09, 2004

EXAMINER: Bryan Bui

GROUP ART UNIT: 2863

FOR: WORKLOAD PLACEMENT AMONG DATA CENTERS BASED ON  
THERMAL EFFICIENCY

**37 CFR 1.322 & 37 CFR 1.323 REQUEST FOR CERTIFICATE OF CORRECTION**

HONORABLE COMMISSIONER OF PATENTS & TRADEMARKS

Sir:

The following is a request for a certificate of correction in Serial Number 10/820,786, now Patent Number 7,197,433.

A certificate of correction under 35 USC 254 is respectfully requested in the above-identified patent.

☐ All errors were the fault of the USPTO, no fee required. In the event that a further fee is required, please charge the amount to Deposit Account No. 082025.

☐ All errors were the fault of the applicant and, accordingly, please charge \$100.00 to our Deposit Account No. 082025. In the event that a further fee is required, please charge the amount to the same Deposit Account.

☒ The errors were the fault of both the applicant and USPTO and, accordingly, please charge \$100.00 to our Deposit Account No. 082025. In the event that a further fee is required, please charge the amount to the same Deposit Account.

The exact locations where the errors appear in the patent and patent application are as follows:

In column 9, lines 3-4, in Equation 3, delete " $SHI = \frac{T_{rockinlet} - T_{ref}}{T_{rockoutlet} - T_{ref}}$ " and

$$SHI = \frac{\hat{T}_{rockinlet} - T_{ref}}{\hat{T}_{rockoutlet} - T_{ref}}$$

insert --  $\hat{T}_{rockinlet} - T_{ref}$  --, therefor.

(Specification filed on Apr. 09, 2004, page 14, line 1)

In column 11, line 7, delete "524c" and insert -- 254c --, therefor.

(Specification filed on Apr. 09, 2004, page 16, line 29)

In column 12, line 50, delete "40 C" and insert -- 40° C --, therefor.

(Specification filed on Apr. 09, 2004, page 19, line 12)

In column 12, line 51, delete "20 C" and insert -- 20° C --, therefor.

(Specification filed on Apr. 09, 2004, page 19, line 12)

In column 12, line 52, delete "10 C" and insert -- 10° C --, therefor.

(Specification filed on Apr. 09, 2004, page 19, line 13)

In column 12, line 55, delete "50 C" and insert -- 50° C --, therefor.

(Specification filed on Apr. 09, 2004, page 19, line 14)

In column 12, line 55, delete "30 C" and insert -- 30° C --, therefor.

(Specification filed on Apr. 09, 2004, page 19, line 14)

In column 13, line 2, delete "30 C" and insert -- 30° C --, therefor.

(Specification filed on Apr. 09, 2004, page 19, line 24)

In column 13, lines 2-3, delete "15 C" and insert -- 15° C --, therefor.

(Specification filed on Apr. 09, 2004, page 19, line 24)

In column 13, line 57, after "set" insert -- point. However, if the RH levels are below the predetermined set point, the CRAC unit 114 may attempt to humidify the cooling fluid delivered to the components 122. In this situation, because the humidification process also requires additional power consumption by the CRAC unit 114, the modified COP will, therefore, be affected by the humidification process as well. The modified COP may thus be used in place of the COP described hereinabove with respect to the determination of the energy efficiency coefficient ( $\chi$ ). In addition, the co-allocator 224 may select the data center 252a-252c having the highest energy efficiency coefficient ( $\chi$ ) based upon the modified COP to perform the requested application 258.

According to another example, a penalty factor may be included in the determination of the energy efficiency coefficients ( $\chi$ ) of the data centers 252a-252c. The penalty factor may substantially be based upon the RH levels around the data centers 252a-252c. Thus, for instance, if the RH level is higher than a predetermined setpoint, a dehumidifier of a CRAC unit 114 may be in operation.

If the dehumidifier is in operation, a penalty factor may be included in the determination of the COP for that data center 252a-252c. By way of example, the co-allocator 224 may decide to withdraw any data centers 252a-252c from consideration in determining whether to allocate the application in that data center 252a-252c, if the penalty factor is detected.

Alternatively, the penalty factor may be assigned according to the level of dehumidifier (or humidifier) operation in the data center 252a-252c. Thus, for instance, values may be assigned to various levels of dehumidifier (or humidifier) activity, which may correlate to the penalty factors of the data centers 252a-252c having dehumidifiers that are operating. In this example, a larger penalty factor may be assigned to those data centers 252a-252c having higher levels of dehumidifier or humidifier activity. The penalty factors may, for instance, be subtracted from or otherwise reduce the COP of the data centers 252a-252c for which the dehumidifiers are operating. In addition, the levels to which the COPs are reduced may be based upon the dehumidification (or humidification) levels. In this regard, the energy efficiency coefficients ( $\gamma$ ) of the data centers 252a-252c having the reduced levels of COP will be lower than for those data centers 252a-252c having COPs which are not reduced due to dehumidification (or humidification) operations. - -.

(Specification filed on Apr. 09, 2004, page 21, lines 1-29)

In column 15, lines 17-62, delete "is point. However, if the RH levels are below the predetermined set .....  
..... reduced due to dehumidification (or humidification) operations. configured" and insert - - is configured - -, therefor.

(Specification filed on Apr. 09, 2004, pages 23-24, lines 29 and 1)

In column 18, line 3, delete "154c" and insert - - 254c - -, therefor.

(Specification filed on Apr. 09, 2004, page 27, line 6)

In column 18, line 5, delete "HP addresses" and insert - - IP addresses - -, therefor.

(Specification filed on Apr. 09, 2004, page 27, line 7)

In column 20, line 67, delete "WPL" and insert - - WPI - -, therefor.

(Specification filed on Apr. 09, 2004, page 31, line 18)

In column 22, line 50, in Claim 1, delete "efficient" and insert - - efficiency - -, therefor.

(Amendment to claims filed on Sep. 01, 2006, page 2, in Claim 1, line 15)

In column 22, line 61, in Claim 4, after "occurring" insert - - in - -.

(Amendment to claims filed on Sep. 01, 2006, page 3, in Claim 4, line 3)

In column 22, line 63, in Claim 4, delete "beat" and insert -- heat --, therefor.  
(Amendment to claims filed on Sep. 01, 2006, page 3, in Claim 4, line 4)

In column 23, line 3, in Claim 6, delete "arid" and insert -- and --, therefor.  
(Amendment to claims filed on Sep. 01, 2006, page 3, in Claim 6, line 2)

In column 24, line 34, in Claim 19, delete "the" before "workload".  
(Amendment to claims filed on Sep. 01, 2006, page 7, in Claim 20, line 8)

In column 24, line 46, in Claim 20, delete "(GRAMS)" and  
insert -- (GRAMs) --, therefor.  
(Amendment to claims filed on Sep. 01, 2006, page 7, in Claim 21, line 2)

In column 25, line 22, in Claim 25, delete "coefficient" and  
insert -- coefficients --, therefor.  
(Amendment to claims filed on Sep. 01, 2006, page 9, in Claim 26, line 4)

In column 25, line 25, in Claim 25, delete "," before "based".  
(Amendment to claims filed on Sep. 01, 2006, page 9, in Claim 26, line 5)

In column 26, line 10, in Claim 29, after "information" insert -- , --.  
(Amendment to claims filed on Sep. 01, 2006, page 11, in Claim 30, line 3)

In column 26, lines 20-21, in Claim 30, after "information" insert -- , --.  
(Amendment to claims filed on Sep. 01, 2006, page 11, in Claim 31, line 5)

In column 26, line 31, in Claim 31, after "centers" insert -- , --.  
(Amendment to claims filed on Sep. 01, 2006, page 11, in Claim 32, line 5)

In column 27, line 32, in Claim 35, delete "the for" and insert -- the means for --,  
therefor.  
(Amendment to claims filed on Sep. 01, 2006, page 13, in Claim 37, line 6)

In column 27, line 55, in Claim 38, delete "center" and insert -- centers --, therefor.

(Amendment to claims filed on Sep. 01, 2006, page 14, in Claim 40, line 8)

The requested corrections are attached on Form PTO 1050.

Respectfully Submitted

5/28/09  
DATE

Denise A. Lee

Name: Denise A Lee  
Registration No.: 35,931

Attorney/Agent of Record

HEWLETT-PACKARD COMPANY  
Intellectual Property Administration  
P.O. Box 272400  
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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 1 of 5

PATENT NO : 7,197,433  
APPLICATION NO. : 10/820,786  
ISSUE DATE : Mar. 27, 2007  
INVENTOR(S) : Chandrakant D. Patel, et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 9, lines 3-4, in Equation 3, delete " $SHI = \frac{T_{rockinlet} - T_{ref}}{T_{rockoutlet} - T_{ref}}$ " and  
$$SHI = \frac{\bar{T}_{rockinlet} - T_{ref}}{\bar{T}_{rockoutlet} - T_{ref}}$$
  
insert --  $\bar{T}_{rockoutlet} - T_{ref}$  --, therefor.

In column 11, line 7, delete "524c" and insert -- 254c --, therefor.

In column 12, line 50, delete "40 C" and insert -- 40° C --, therefor.

In column 12, line 51, delete "20 C" and insert -- 20° C --, therefor.

In column 12, line 52, delete "10 C" and insert -- 10° C --, therefor.

In column 12, line 55, delete "50 C" and insert -- 50° C --, therefor.

In column 12, line 55, delete "30 C" and insert -- 30° C --, therefor.

In column 13, line 2, delete "30 C" and insert -- 30° C --, therefor.

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According to another example, a penalty factor may be included in the determination of the energy efficiency coefficients ( $\chi$ ) of the data centers 252a-252c. The penalty factor may substantially be based upon the RH levels around the data centers 252a-252c. Thus, for instance, if the RH level is higher than a predetermined setpoint, a dehumidifier of a CRAC unit 114 may be in operation. If the dehumidifier is in operation, a penalty factor may be included in the determination of the COP for that data center 252a-252c. By way of example, the co-allocator 224 may decide to withdraw any data centers 252a-252c from consideration in determining whether to allocate the application in that data

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In column 15, lines 17-62, delete "is point. However, if the RH levels are below the predetermined set .....  
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In column 18, line 3, delete "154c" and insert - - 254c - -, therefor.

In column 18, line 5, delete "HP addresses" and insert - - IP addresses - -, therefor.

In column 20, line 67, delete "WPL" and insert - - WPI - -, therefor.

In column 22, line 50, in Claim 1, delete "efficient" and insert - - efficiency - -, therefor.

In column 22, line 61, in Claim 4, after "occurring" insert - - in - -.

In column 22, line 63, in Claim 4, delete "beat" and insert - - heat - -, therefor.

In column 23, line 3, in Claim 6, delete "arid" and insert - - and - -, therefor.

In column 24, line 34, in Claim 19, delete "the" before "workload".

In column 24, line 46, in Claim 20, delete "(GRAMS)" and insert - - (GRAMs) - -, therefor.

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It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 25, line 22, in Claim 25, delete "coefficient" and insert - - coefficients - -, therefor.

In column 25, line 25, in Claim 25, delete ",", before "based".

In column 26, line 10, in Claim 29, after "information" insert - - , - -.

In column 26, lines 20-21, in Claim 30, after "information" insert - - , - -.

In column 26, line 31, in Claim 31, after "centers" insert - - , - -.

In column 27, line 32, in Claim 35, delete "the for" and insert - - the means for - -, therefor.

In column 27, line 55, in Claim 38, delete "center" and insert - - centers - -, therefor.

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